

# CLAIMS

1. A polyester multifilament yarn comprising, as a principal component, a polyester polymer produced by polycondensing an aromatic dicarboxylate ester in the presence of a catalyst,

wherein

the catalyst comprises at least one member selected from mixtures (1) and reaction products (2);

the mixtures (1) for the catalyst

comprises a titanium compound component (A) mixed with phosphorus compound component (B),

in which mixtures (1),

the component (A) comprises at least one member selected from the group consisting of (a) titanium alkoxides represented by the general formula (I):

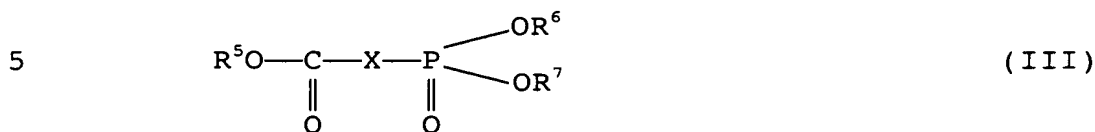


in which formula (I),  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^3$  and  $\text{R}^4$  respectively and independently from each other represent a member selected from alkyl groups having 1 to 20 carbon atoms and a phenyl group,  $m$  represent an integer of 1 to 4, and when  $m$  represents an integer of 2, 3 or 4, the 2, 3 or 4  $\text{R}^2$ s and  $\text{R}^3$ s may be respectively the same as each other or different from each other, and (b) reaction products of the titanium compounds of the general formula (I) with aromatic polycarboxylic acids represented by the formula (II):



in which formula (II),  $n$  represents an integer of 2 to 4, or anhydrides of the acids of the formula (II); and the component (B) comprises at least one

phosphorus compound represented by the general formula (III):



in which formula (III),  $\text{R}^5$ ,  $\text{R}^6$  and  $\text{R}^7$  respectively and independently from each other represent an alkyl group having 1 to 4 carbon atoms, X represents a member selected from a  $-\text{CH}_2-$  group and a  $-\text{CH}(\text{Y})-$  group (wherein Y represents a phenyl group),

the mixture (1) for the catalyst for the polycondensation being employed in an amount satisfying the requirements represented by the following expressions of relation (i) and (ii):

$$1 \leq M_p/M_{Ti} \leq 15 \quad \text{(i)}$$

and

$$10 \leq M_p + M_{Ti} \leq 100 \quad \text{(ii)}$$

wherein  $M_{Ti}$  represents a ratio in % of a value in millimoles of titanium element contained in the titanium compound component (A) to a value in moles of the aromatic dicarboxylate ester, and  $M_p$  represents a ratio in % of a value in millimoles of phosphorus element contained in the phosphorus compound component (A) to the value in moles of the aromatic dicarboxylate ester,

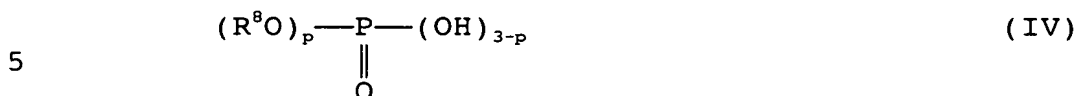
the reaction products (2) for the catalyst comprises a component (C) reacted with a component (D),

in which reaction products (2),

the component (C) comprises at least one member selected from the group consisting of (c) titanium alkoxides represented by the general formula (I) and (d) reaction products of the titanium alkoxides of the general formula (I) with aromatic polycarboxylic acids represented by the above-mentioned general formula (II) or anhydride of the acids; and

the component (D) comprises at least one

phosphorus compound represented by the general formula (IV):



10                    in which formula (IV),  $R^8$  represents an alkyl group having 1 to 20 carbon atoms or any aryl group having 6 to 20 carbon atoms, and  $p$  represents an integer of 1 or 2, and

                    the multifilament yarn has a thickness of individual filaments of 0.3 to 2.0 dtex, a total thickness of the yarn of 90 dtex or less, and a silk factor (S.F.) value of 22 or more, determined in accordance with the following equation (1):

$$(S.F.) = (Tensile\ strength) \times (Ultimate\ elongation)^{1/2} \quad (1).$$

20                    2. The polyester multifilament yarn as claimed in claim 1, wherein in the component (A) of the mixture (1) for the catalyst, a reaction molar ratio of titanium alkoxide (a) to the aromatic polycarboxylic acid of the general formula (II) or the anhydride thereof is in the range of from 2:1 to 2:5.

25                    3. The polyester multifilament yarn as claimed in claim 1, wherein the dialkyl aromatic dicarboxylate ester is one produced by a transesterification reaction of a dialkyl ester of an aromatic dicarboxylic acid with an alkylene glycol.

30                    4. The polyester multifilament yarn as claimed in claim 3, wherein the aromatic dicarboxylic acid is selected from terephthalic acid, 1,2-naphthalene dicarboxylic acid, phthalic acid, isophthalic acid, diphenyldicarboxylic acid, and diphenoxyethane  
35                    dicarboxylic acid and the alkylene glycol is selected from ethylene glycol, butylene glycol, trimethylene glycol, propylene glycol, neopentyl glycol, hexamethylene glycol and dodecamethylene glycol.

5. The polyester multifilament yarn as claimed in claim 1, wherein the polyester is a polyethylene terephthalate.

5 6. The polyester multifilament yarn as claimed in claim 1, wherein the polyester polymer has an L\* value of 60 to 90 and a b\* value of 1 to 10, determined in accordance with the L\*a\*b\* color specification of JIS Z 8729.

10 7. The polyester multifilament yarn as claimed in any one of claims 1 to 8, in the form of a woven or knitted fabric.